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## EUROPEAN PATENT APPLICATION

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**AT BE CH DE DK ES FR GB GR LI LU NL SE**

(71) Applicant : **UFM S.A.**  
**Via Volta, 2/A**  
**CH-6830 Chiasso (CH)**

(72) Inventor : **Bagnaia, Luigi, c/o UFM S.A.**  
**Via Volta, 2/A**  
**CH-6830 Chiasso (CH)**

(74) Representative : **Baldi, Claudio**  
**Piazza Ghislieri, 3**  
**I-60035 Jesi (Ancona) (IT)**

(54) **Moulded plastic insole, with numerous air cushions within the cells of a net bearing structure.**

(57) This invention concerns an insole, moulded in plastic material, with numerous air cushions within the cells of a netted bearing structure covered at the top with one or more sheets, also moulded in plastic material, which have many convex pads on their upper surface, these being dimensioned, shaped and distributed in such a way that they are positioned exactly in the centre of the cells of the underlying netted structure.

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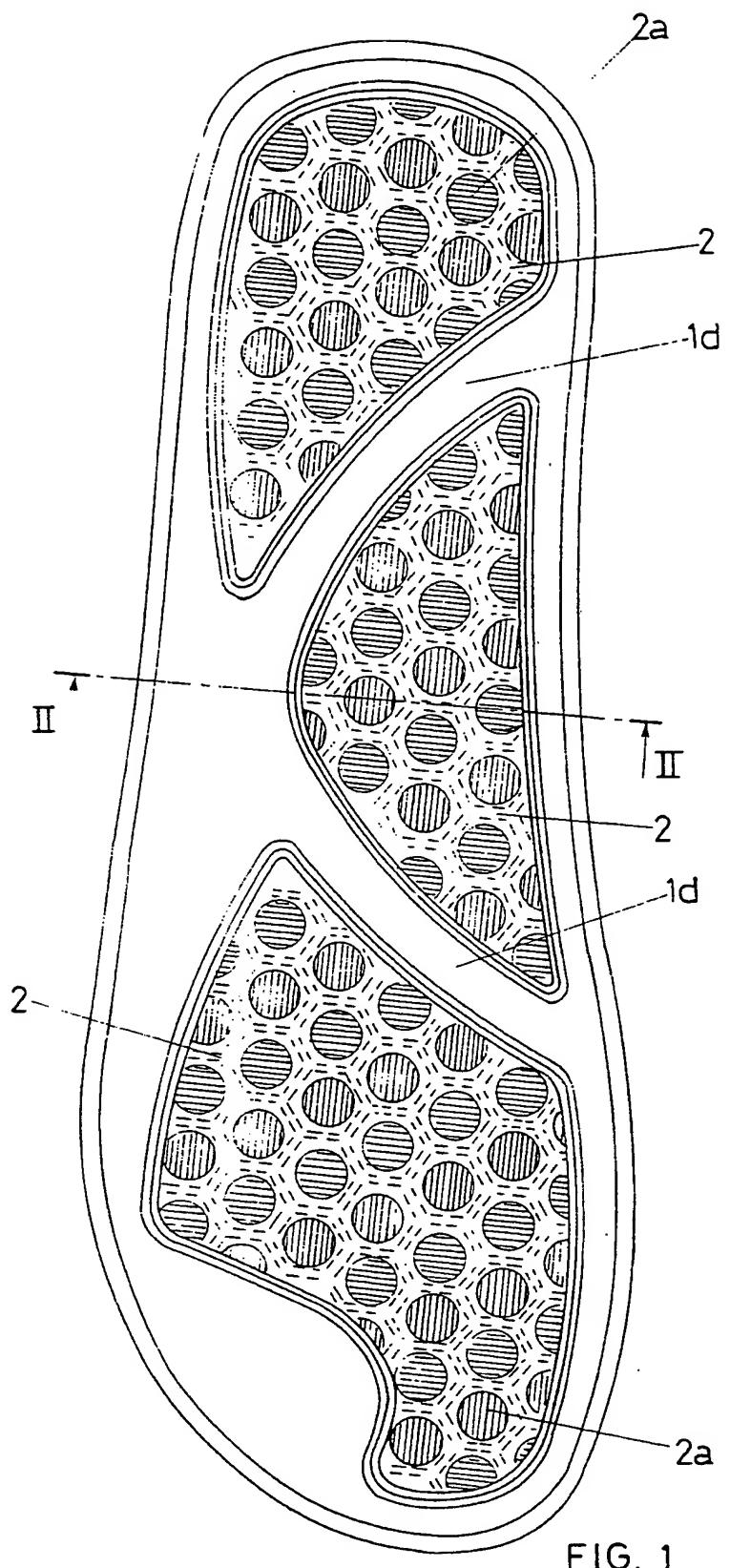


FIG. 1

This patent application for an industrial utility model concerns an insole, moulded in plastic material, particularly suitable for fitting to mules for use on beaches or in swimming pools, which have bottoms formed by moulding with an ample hollow space at the top within which the insole can be housed and glued.

The characteristic of the insole in question is that it has a closely packed series of small, soft air cushions, obtained by covering a netted structure, also formed by moulding, in a thin moulded plastic sheet, which actually makes up the bearing structure of the insole in question. More particularly, said covering sheet has on its upper face, a closely packed series of circular humps with a slightly convex profile, which are dimensioned and distributed in such a way as to be positioned exactly at the centre of each cell of the underlying netted structure. The sole of the foot, therefore, comes to rest on a series of lenticular pads, which, under pressure, firstly give elastically sinking into the spaces below corresponding to the various cells of the net structure and then spring back once the pressure of the foot ceases.

Therefore, each cell creates a small air cushion able to deflect elastically and adapt to the anatomical conformation of the sole of the foot, on which, due to the action of all these air cushions, a beneficial mini-massage is carried out, able to stimulate and vitalise the circulation of the blood.

This structural conformation of the insole in question is a totally new and original concept, compared to equivalent models currently available, in which the air cushions are normally obtained by the airtight coupling of two sheets one above the other, between which in some pre-established areas, empty spaces are left in which air is imprisoned. In monolithic insoles formed by moulding, on the other hand, said air cushions are produced by creating on the insole a closely packed series of semi-spherical humps, inside the cavity of which air is obviously imprisoned, once these insoles have been fitted and glued to the bottom of the mules.

For further clarity of explanation, the description of the invention continues with reference to the attached drawings, which are reproduced for illustrative and not limitative purposes, wherein :

- Fig. 1 shows the insole in question seen as a plan view from the top.
- Fig. 2 is the section of Fig. 1 in plan II-II.
- Fig. 3 shows a part of the insole in question seen in plan view from the bottom.

With reference to the aforementioned figures, the model in question comprises a bearing structure formed by moulding in soft plastic material, which is characterised by its netted configuration; more precisely this structure has a continuous perimetral edge (1a), inside which there is a tight net (1b) in order to delimitate numerous cells (1c).

In this case, the net has hexagonal cells, but it is clear that the profile and expanse of said cells can vary in individual cases, according to requirements or preferences; the same applies to the thickness of the net (1b) which can be uniform or vary from one area of the insole to another, should it be required for the insole to conform to the anatomical course. On top of the bearing structure, a sheet (2) is spread and fixed, which is moulded in soft, flexible plastic material and which encloses all the cells (1c) below in an airtight manner. On the upper surface of this sheet (2), during the moulding phase, a number of convex pads (2a) are produced, which are dimensioned, shaped and distributed in such a way as to be positioned exactly at the centre of the underlying cells (1c).

In this case, the covering sheets (2) are three in number, given the fact that the structure in Fig. 1 has several transversal strips (1d), obtained in a single piece together with the structure, which divide the sole into three distinct, separate areas; one towards the heel, one at the longitudinal arch of the foot and one towards the tip.

Attention is drawn to the fact that each pad (2a) has a rough, anti-slip surface, in this case obtained by means of a closely packed series of parallel incisions, orientated alternately in the longitudinal and in the transversal direction, passing from one pad to the adjacent one. It is understood, however, that the anti-slip design reproduced on the pads (2a) may be of any type, without this factor going beyond the scope of patent protection. According to a further preferred form of embodiment of the model according to the invention, the net structure and the covering sheets could be obtained in the same phase and from the same moulding material without undermining the functional efficiency of the insole in question. It is, in fact clear, that the use of covering sheets moulded separately from the net structure, is dictated solely by the requirements of design and has nothing at all to do with functionality, given the fact that in the case of separate and distinct moulding of the two aforementioned-components, it will be possible to use different coloured material, thereby obtaining a polychromatic effect on the insole.

## Claims

1) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that it consists of a bearing structure formed in a single piece of soft plastic material, which has a perimetral edge (1a) within which there is a tight net (1b) intended to delimitate a number of cells (1c), which are closed at the top by one or more sheets (2), also moulded in soft plastic material, spread over and hermetically fixed to the underlying net structure; there being on the upper

surface of said sheets (2), a number of convex pads (2a), dimensioned, shaped and distributed so as to be positioned exactly at the centre of the underlying cells (1c);

2) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, according to Claim 1), characterised by the fact that the convex pads (2A) have a non-slip surface;

3) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that the thickness of the net structure is uniform;

4) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that the thickness of the net structure varies from one area to another so that the top of the insole follows an anatomical course;

5) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that in a preferred embodiment, the net structure has hexagonal cells;

6) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that in a preferred embodiment, the aforementioned net structure and the covering sheets (2) are produced in the same moulding phase and from the same material.

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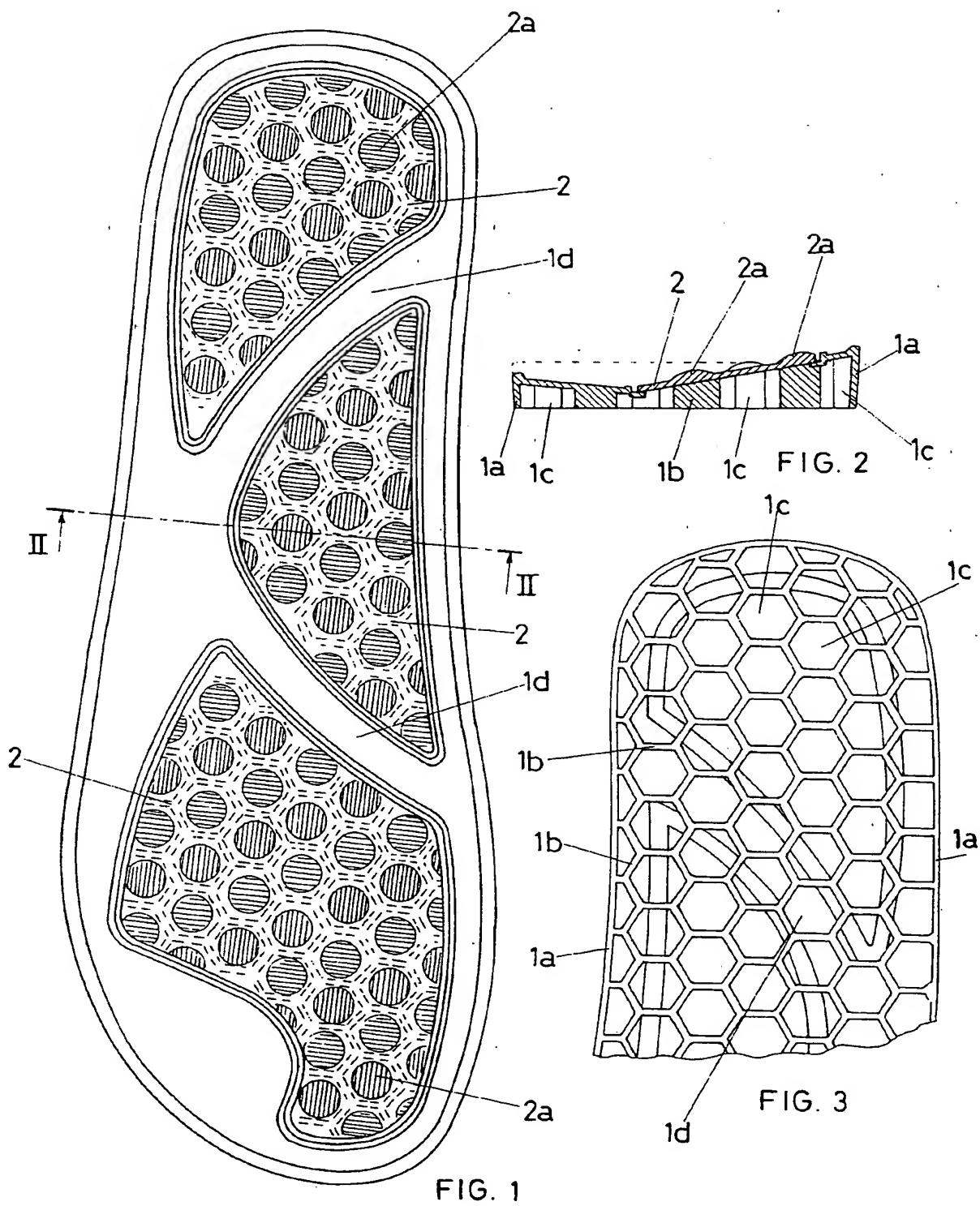
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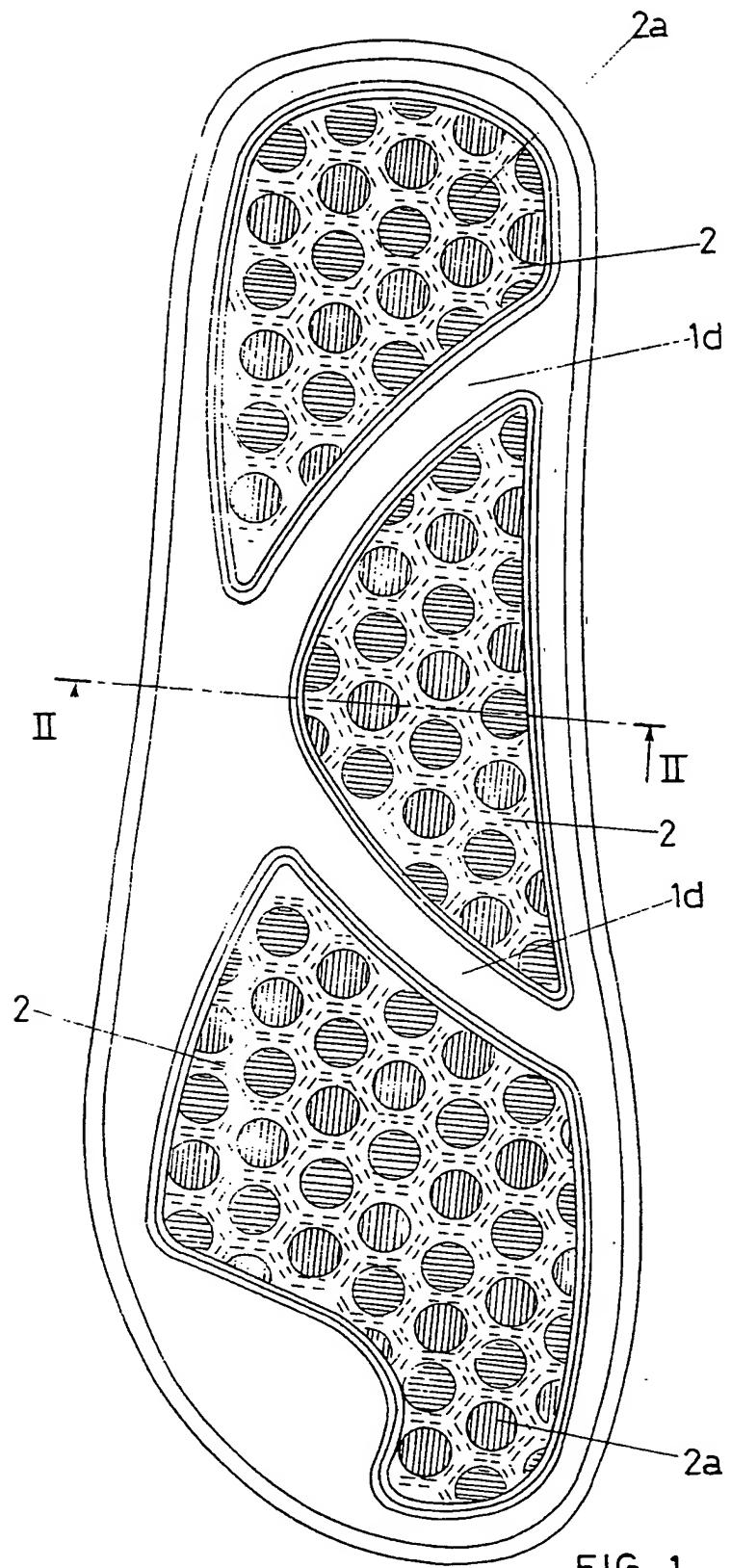


FIG. 1

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In this case, the covering sheets (2) are three in number, given the fact that the structure in Fig. 1 has several transversal strips (1d), obtained in a single piece together with the structure, which divide the sole into three distinct, separate areas; one towards the heel, one at the longitudinal arch of the foot and one towards the tip.

Attention is drawn to the fact that each pad (2a) has a rough, anti-slip surface, in this case obtained by means of a closely packed series of parallel incisions, orientated alternately in the longitudinal and in the transversal direction, passing from one pad to the adjacent one. It is understood, however, that the anti-slip design reproduced on the pads (2a) may be of any type, without this factor going beyond the scope of patent protection. According to a further preferred form of embodiment of the model according to the invention, the net structure and the covering sheets could be obtained in the same phase and from the same moulding material without undermining the functional efficiency of the insole in question. It is, in fact clear, that the use of covering sheets moulded separately from the net structure, is dictated solely by the requirements of design and has nothing at all to do with functionality, given the fact that in the case of separate and distinct moulding of the two aforementioned-components, it will be possible to use different coloured material, thereby obtaining a polychromatic effect on the insole.

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## Claims

- 50 1) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that it consists of a bearing structure formed in a single piece of soft plastic material, which has a perimetral edge (1a) within which there is a tight net (1b) intended to delimitate a number of cells (1c), which are closed at the top by one or more sheets (2), also moulded in soft plastic material, spread over and hermetically fixed to the underlying net structure; there being on the upper

surface of said sheets (2), a number of convex pads (2a), dimensioned, shaped and distributed so as to be positioned exactly at the centre of the underlying cells (1c);

2) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, according to Claim 1), characterised by the fact that the convex pads (2A) have a non-slip surface;

3) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that the thickness of the net structure is uniform;

4) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that the thickness of the net structure varies from one area to another so that the top of the insole follows an anatomical course;

5) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that in a preferred embodiment, the net structure has hexagonal cells;

6) Insole, in moulded plastic, which has numerous air cushions within the cells of a netted bearing structure, characterised by the fact that in a preferred embodiment, the aforementioned net structure and the covering sheets (2) are produced in the same moulding phase and from the same material.

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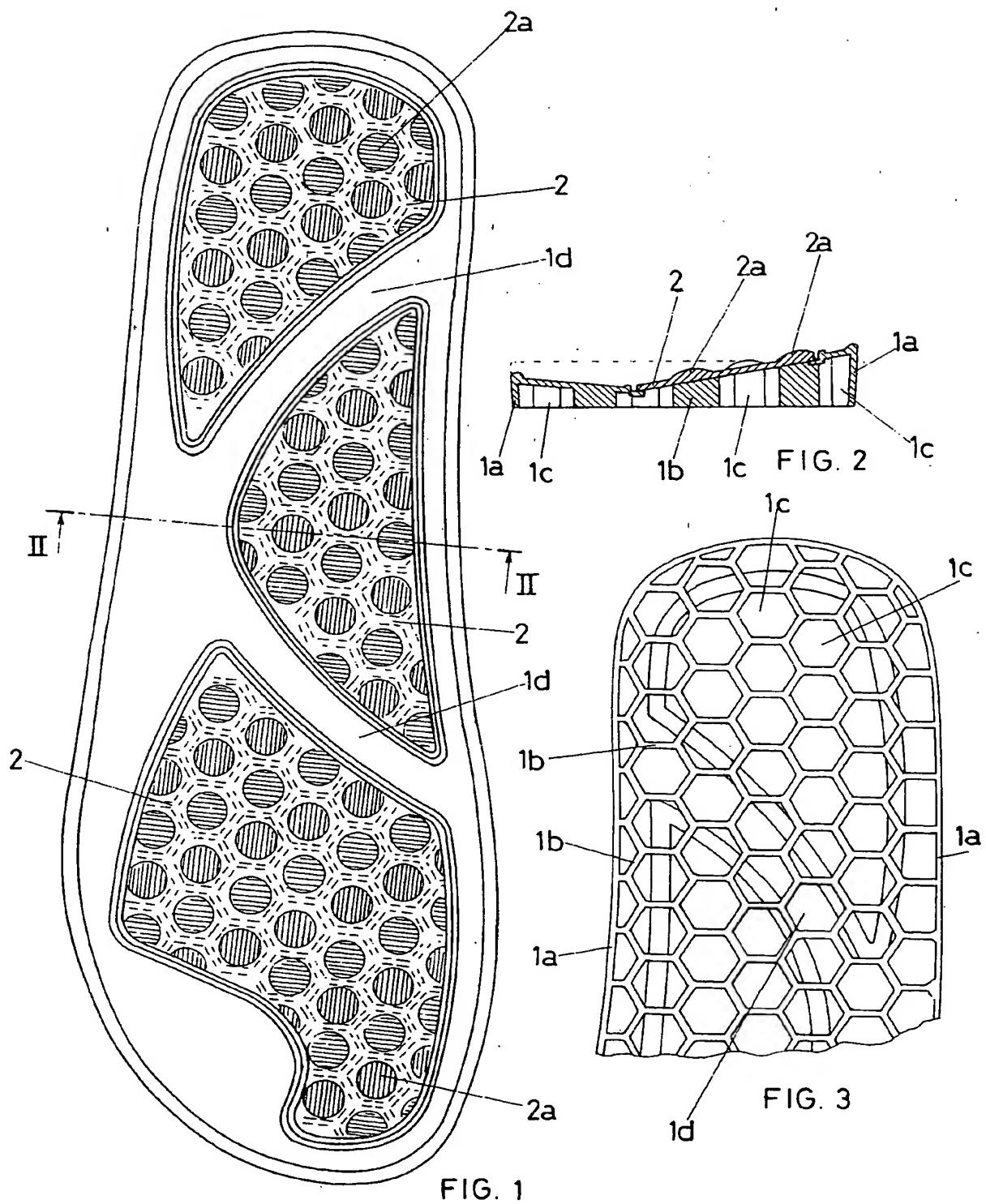


FIG. 1

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